

## Abstract

Disclosed is an active power filter with a reduced VA rating for reducing harmonic currents in a neutral line in a three-phase four-line power system. An inverter is connected to the neutral line for PWM-controlling current flow of the neutral line based on a voltage control signal from a controller so that a fundamental component of a load-side neutral current flows to the three-phase AC power source and its harmonic component is circulated to the load. A transformer is connected between the neutral line and each phase line of the three-phase AC power source for forming a current path whereby the harmonic component flows to the load through the phase line. A rectifier is connected between the transformer and the inverter for rectifying drive voltage into DC voltage and applying it to the inverter.



**(10) International Publication Number**  
**WO 2004/010558 A1**

- (51) **International Patent Classification<sup>7</sup>:** H02J 3/01

(21) **International Application Number:** PCT/KR2003/000001

(22) **International Filing Date:** 2 January 2003 (02.01.2003)

(25) **Filing Language:** Korean

(26) **Publication Language:** English

(30) **Priority Data:** 10-2002-0042275 19 July 2002 (19.07.2002) KR

(71) **Applicant (for all designated States except US):** POWER SYSTEM DIAGNOSIS TECH., INC. [KR/KR]; #303, Hyundai 1 Valley, 223-12, Sangdaewon-1-Dong, Jungwon-Gu, Seongnam-City, 462-807 Gyeonggi-Do (KR).

(72) **Inventor; and**

(75) **Inventor/Applicant (for US only):** CHOI, Se-Wan [KR/KR]; 108-1603 Ilakyoul Chunggu Apt, Ilgye-2-Dong, Nowon-Gu, 139-734 Seoul (KR).

(74) **Agent:** I. & K PATENT FIRM; 701, Daekun Bldg., 822-5, Yeoksam-Dong, Kangnam-Gu, 135-080 Seoul (KR).

(81) **Designated States (national):** AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GI, GM, GR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

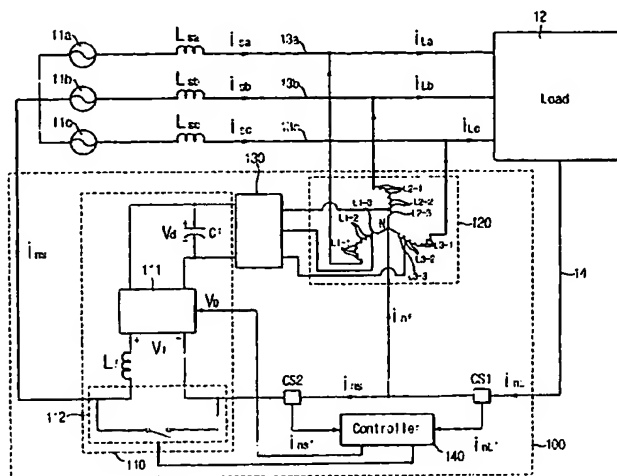
(84) **Designated States (regional):** ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Declaration under Rule 4.17:**  
 — as to non-prejudicial disclosures or exceptions to lack of novelty (Rule 4.17(v)) for all designations

**Published:**  
 — with international search report  
 — with a declaration as to non-prejudicial disclosures or exceptions to lack of novelty

*[Continued on next page]*

(54) **Title:** ACTIVE POWER FILTER APPARATUS WITH REDUCED VA RATING FOR NEUTRAL CURRENT SUPPRESSION



(S7) **Abstract:** Disclosed is an active power filter with a reduced VA rating for reducing harmonic currents in a neutral line in a three-phase four-line power system. An inverter is connected to the neutral line for PWM-controlling current flow of the neutral line based on a voltage control signal from a controller so that a fundamental component of a load-side neutral current flows to the three-phase AC power source and its harmonic component is circulated to the load. A transformer is connected between the neutral line and each phase line of the three-phase AC power source for forming a current path whereby the harmonic component flows to the load through the phase line. A rectifier is connected between the transformer and the inverter for rectifying drive voltage into DC voltage and applying it to the inverter.